REMARKS

Claims 1-32 remain in the application. Reexamination and reconsideration of the application are respectfully requested.

Claims 1-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki USP 6,185,040 in view of Miron USP 7,002,696. Claims 33-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki in view of Miron and Ranalli USP 6,285,500. The rejections are respectfully traversed.

Finality of Office Action

While the undersigned maintains that the finality of the prior Office Action is premature for the reasons previously presented, for purposes of expediting examination, the present response is accompanied by a Request for Continued Examination.

Rejection of Claims 1-32 Under 35 U.S.C. §103(a)

Claims 1-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki USP 6,185,040 in view of Miron USP 7,002,696. The rejection is respectfully traversed for the reasons set forth in the prior Amendment Under 37 CFR 1.111 filed September 3, 2008 and Amendment Under 37 CFR 1.116 filed February 26, 2009, both incorporated herein in their entireties and further supplemented herein. As detailed therein, the claims are directed to methods and systems comprising a number of elements in combination. Amended claim 1, for example, is directed to a transmitting system comprising a processor, an integration lens, an optical fiber and a variable reflectivity surface. The variable reflectivity surface varies in reflectivity along its length and is configured to impart a desired amplitude profile onto the output taps.

In contrast to the rejected claims, neither Shirasaki nor Miron, singularly or in combination, disclose or suggest a similar combination of elements. The Examiner's application of Miron to supplement the disclosure of Shirasaki fails to rehabilitate the rejection, neither teaching or suggesting a combination including a variable reflectivity surface that varies in reflectivity along its

length and is configured to impart a desired amplitude profile onto output taps. Contrary to the position taken by the Examiner, there is no teaching or suggestion in Miron or in any other cited reference of a combination including a variable reflectivity surface that varies in reflectivity along its length.

1. The Examiner's Reliance on Miron is Misplaced

The Examiner cites to Miron at "column 9 lines 23-49 [as] describing [a] variable reflectivity surface ..." Office action at page 3, line 10. It is respectfully urged that such is not the case. Instead, the cited portion Miron fails to disclose, suggest or even hint at a variable reflectivity surface. The cited portion of Miron discloses only an adjustable index of refraction in the transparent non-reflecting part of the device and a variable spacing of the reflective plates. Neither of these variabilities has anything to do with variable reflectivity along the length of a surface. The two variabilities described affect tuning of the response of the device in wavelength. In contrast, the claimed variable reflectivity along the length of a surface affects the spatial spot shape at the focal plane of the device. These are two completely different effects resulting from two completely different variables.

The Examiner's analysis is also flawed in connection with variations in light intensity. In particular, the Examiner takes the position that Miron, at "column 10 lines 5-44 [discloses] variation in reflectivity from total reflection to partial reflection as light traverses the reflective device." This conclusion is not correct; the cited section of Miron has nothing to do with variable reflectivity. To the contrary, this cited portion explicitly verifies that Miron's device uses constant reflectivity along the length of the surface. Specifically, Miron at column 10 lines 41-44 discloses that the intensities of the beam inside the propagating medium and the intensities of the output beams are both decreasing in "geometric regression." Such "geometric regression" only occurs if the reflectivity along the surface of the device is constant varying as claimed. Having a reflectivity that varies in contrast, in embodiments according to the present application, the reflectivity can be tailored to generate output beams that have a Gaussian variation in intensity along the surface of the reflector. It appears that the Examiner may be confusing a geometric decrease in the light intensity

with a geometric decrease in reflectivity; the reflectivity according to Miron does not vary, only the light intensity changes.

The Examiner's position that Miron discloses a "variable reflectivity surface in order to allow for tuning of the optical device" (citing column 12 lines 20-26 of Miron) is likewise in error. Again, Miron does not disclose or suggest a variable reflectivity surface. Instead, the variability that Miron discloses is in wavelength tuning (via change in index of refraction, plate spacing, or incidence angle) and has nothing to do with variable reflectivity along the surface of the device.

2. The Examiner's Characterization of Shirasaki is Erroneous

The Examiner's characterization of Shirasaki is also flawed. For example, at page 4 of the Office Action the Examiner takes the position that the outputs are "spatially distinct (Figure 7)". While Figure 7 as drawn might, at first glance, give one the impression of "distinct" beams, extending each beam all the way to the surface 122 would make it apparent that the beams greatly overlap at surface 122, with the overlap becoming greater for each successive output tap. Thus, Shirasaki's beams are clearly not collimated and the beams are not "distinct" at surface 122.

The Examiner's statements that the outputs of Shirasaki are "independently phase shifted" citing to column 9 lines 46-47, is likewise incorrect. In fact, Shirasaki states that his device "maintains a constant phase shift between interfering lights." Because the device disclosed by Shirasaki does not maintain spatially distinct beams, it cannot independently phase shift its outputs; they must remain at constant phase.

3. The Arguments for Patentability Presented in Prior Responses are Reasserted

In so far as in the Advisory Action mailed March 17, 2009 the Examiner summarily dismisses without explanation Applicants' arguments for patentability presented in the Response Under 37 CFR 1.116 filed February 26, 2009, those arguments are repeated below. To the extent that the Examiner maintains any of the outstanding rejections and/or disagrees with Applicants'

positions taken and statements made herein, it is respectfully requested that the Examiner specifically identify and address those points on which there continues to be disagreement.

For example, the Examiner has previously taken the position that:

> Regarding applicants' amendment and subsequent argument that Miron fails to teach a surface having a variable reflectivity that varies in reflectivity along its length, the examiner disagrees. As noted in the amended office action, Miron clearly provides a variable reflectivity surface that varies in reflectivity along its length in that, as previously noted, the spacing between the reflective layers is variable thereby allowing adjustment to the optical path difference (OPD) which is an even multiple of the elementary optical path difference (EOPD) and further allows control over optical intensity of the output beams (column 7 lines 1-10). Furthermore, the variable reflectivity surface can be broadly considered as being variably reflective along its length being that the light which propagates the length of the reflective surface encounters reflective materials which vary from fully reflective to partially reflective to fully reflective to partially reflective, etc.

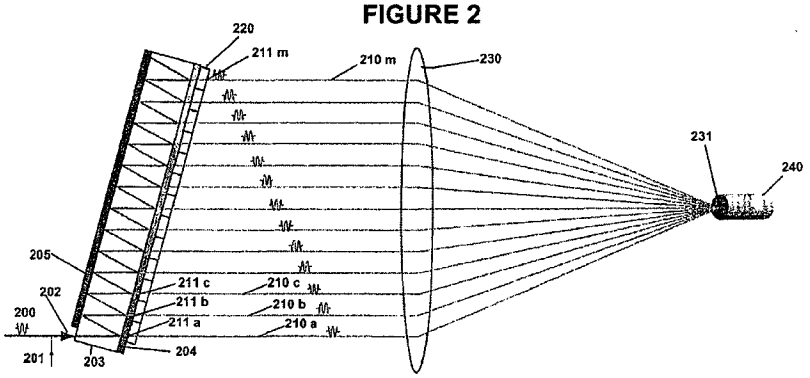
Office Action of November 26, 2008 at pages 8-9.

However, having a variable spacing between reflective layers is not the same as the layers or their surfaces having the claimed variable reflectivity surface which varies in reflectivity along its length. To hold otherwise is to ignore the language of the claim.

Applicants' claims include combinations of elements including surfaces having the claimed variable reflectivity surface which varies in reflectivity along its length. A full description of such a combination, including a variable reflectivity surface that varies in reflectivity along its length, is found, for example, in paragraphs 50 and 56 taken together with Figures 2 and 3 of the present application:

> [0050] ...The reflective coating of surface 204 preferably varies in reflectivity along its length, with high reflectivity at the start and decreasing along its length, so as to ensure equal intensity of the exiting beams. The reflectivity may also vary such as to impart any other desired amplitude profile onto the beams.

FIGURE 2



[0056] The reflective coating of surface 304 varies in reflectivity along its length, with high reflectivity at the start and decreasing along its length, so as to ensure equal intensity of the exiting beams. The reflectivity may also vary such as to impart any other desired amplitude profile onto the beams.

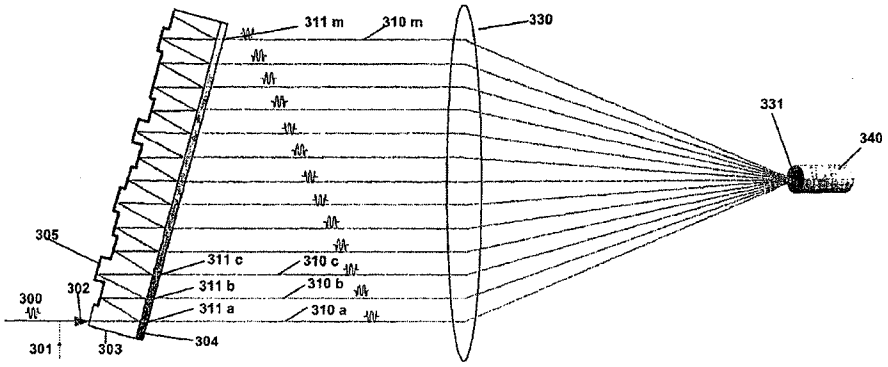


FIGURE 3

The rejected claims clearly describe a combination in which a variable reflectivity **surface** varies in reflectivity along its length. This is different from opposing optical planes, one of which is "totally reflective" and the other "partially reflective" or even having a distance between the planes adjustable so that there may be control over the optical intensity of an output beam. Contrary to the Examiner's position, this claim language is not satisfied by a configuration in which light propagates between surfaces of partially and fully reflective materials.

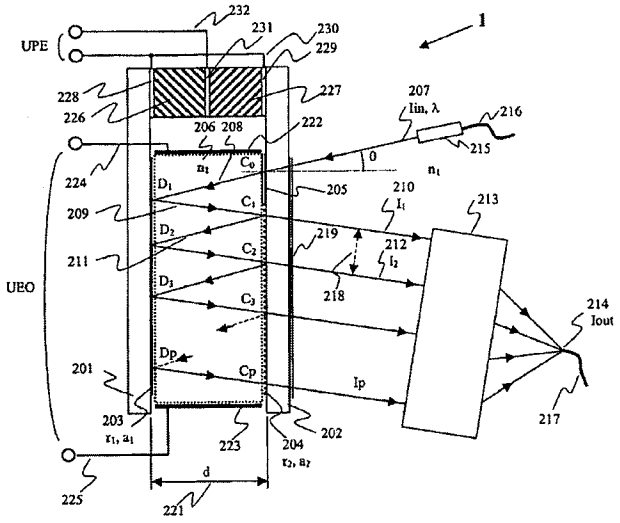


Figure 2a

With reference to Fig. 2a of Miron, 203 is described as a "totally reflective layer" while 204 as a "partially reflective layer." Neither is described as having a variable reflectivity that varies in reflectivity along its length. Miron simply fails to describe, suggest, or otherwise teach any variable reflectivity surface that varies in reflectivity along its length, i.e., the length of the surface. To hold that this is equivalent to having light propagate between layers of different reflectivity simply ignores the clear language of the claims and is otherwise baseless and improper. In as much as the Examiner recognizes and acknowledges that "Shirasaki fails to specifically teach ...that the reflective surface is variable and varies in reflectivity along its length" (Office Action at page 4), it is clear that the combination of Shirasaki and Miron also fails to teach a combination including this feature for the reasons present above. Accordingly, the rejection of independent claims 1-3, 5-7 and 9-14 is improper and should be withdrawn.

Insofar as Shirasaki and Miron, singularly or in combination with each, do not disclose or suggest the subject matter of independent claims 1-3, 5-7 and 9-14, and insofar as the dependent claims rejected under 35 USC §103 all depend from one of these base claims, it follows that claims 4, 8 and 15-32 are also all are allowable.

Rejection of Claims 33-38 Under 35 U.S.C. §103(a)

Claims 33-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki in view of Miron and Ranalli USP 6,285,500. The rejection is respectfully traversed for the reasons set forth in the Amendment Under 37 CFR 1.111 filed September 3, 2008 and incorporated herein in its entirety, for the reasons present above in connection with claims 1-32, and for the reasons that follow.

As described above, the art of record, singularly or in combination, fails to describe or suggest a combination including a variable reflectivity surface which varies in reflectivity along its length and which is configured to impart a desired amplitude profile onto the output taps. The addition of Ranalli fails to cure this deficiency.

Further, as detailed in the previous Amendment, claims 33-38 recite a combination including a second input beam which projects at an angle to a plane of the optical tapped delay line linear array to interfere with each optical tapped delay line beam and establish a region of spatial overlap of the optical tapped delay line beams, and a two-dimensional photo detector array arranged to sample the interfering beams and spatially operate on the beams in the regions of spatial overlap. An example of this embodiment is described in paragraph 65 of the present application, in which two illuminations on the photo detector are tilted in phase as a result of the separation of two illumination sources such that the interference between them produces a single cycle of a spatial carrier across the four detector rows. This spatial carrier allows the detection of the complex correlation value.

A similar combination is neither disclosed nor suggested in Ranalli. Ranalli fails to teach or suggest using the interference of light. Ranalli solely uses the polarization differences to operate on the light, passing two light beams through the same space but with differing propagation directions so that they become spatially separable upon exit. In contrast, independent claims 33 and 36 and the claims dependent therefrom spatially operate on the light in the region of spatial overlap,

thereby taking advantage of the interference. A similar combination is neither disclosed nor suggested in Ranalli.

In response, the Examiner asserts:

> Regarding the newly added limitations dealing with spatial overlap, the examiner initially notes that Shirasaki discloses this limitation via disclosure of interfering collimated light 136 in Figure 7. Shirasaki, as previously discussed, also discloses the two-dimensional photodetector array which clearly operates on the beams in the regions of spatial overlap. Furthermore, the examiner maintains that the Ranalli reference allows the taps to interfere being that, as noted by applicants, the taps occupy the same position in space. As to applicants' assertion that the beams in Ranalli do not interfere since they are orthogonal, the examiner notes that Ranalli specifically teaches that:
>
> > "Beam combiner 44 creates two identical sets of superimposed wavelength channels (1s, 2p) incident focusing lens 46. By superimposing each of the s-polarized wavelength channels with its corresponding p-polarized wavelength channel, each superimposed wavelength channel includes the information payload from the first fiber wavelength channel (1s) and the second fiber wavelength channel (2p). Lens 46 focuses each superimposed wavelength channel onto its respective liquid crystal switch cell 22 to thereby combine the two identical sets of information into one superimposed wavelength channel incident on switch cell 22."
>
> In other words two optical wavelength signals having the same polarization occupy the nearly the same position in space, which, according to applicants produces interference. Furthermore, interference by definition is the superposition of two or more waves resulting in a new wave pattern. This is clearly the case in Figure 5 of Ranalli.

Office Action at pages 9-10.

However, contrary to the Examiner's assertion that the "two optical wavelength signals [have] the same polarization" and thus interfere, the cited portion of describes "superimposing each of the **s-polarized** wavelength channels with its corresponding **p-polarized** wavelength channel", i.e., optical wavelengths of **different** polarizations with p-polarization being light polarized in the plane, s-polarization being light polarized **perpendicular** to the p-polarized light.

As Ranalli, singularly or in combination with Shirasaki and/or Miron, fails to teach or suggest the combination of independent claims 33 and 36 and the claims dependent therefrom

including spatially operating on the light in the region of spatial overlap the rejection of claims 33-38 is further improper.

For the reasons presented above, claims 33-38 are allowable over the applied art and withdrawal of the outstanding rejection of those claims is respectfully solicited.

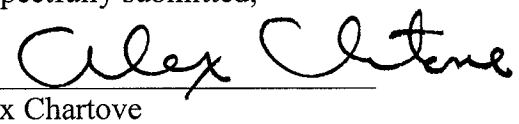
Summary

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 509622000700.

Dated: March 26, 2009

Respectfully submitted,

By 

Alex Chartove
Registration No.: 31,942
MORRISON & FOERSTER LLP
1650 Tysons Blvd, Suite 400
McLean, Virginia 22102
(703) 760-7744